



What Is Bicycle and Pedestrian Level of Service?

- Measures of walkability and bikeability
- Quality of service concept, scored A-F
- Model based on field studies, “Fun Ride for Science” and “Fun Walk for Science”
- Participants from a cross-section of age, gender, and experience level
- Statistically calibrated using real-time perceptions

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Limitations of Bicycle and Pedestrian Level of Service

- Not a safety model
- Does not consider off-road bike facilities
- Not calibrated for truck routes
- Not calibrated for CBDs with high parking turnover
- Preceded development of cycle tracks

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What Is the Purpose of Bicycle and Pedestrian Level of Service?

- Performance tracking of walkability and bikeability
- Probably more importantly, establishment of performance standards for walkability and bikeability in project development
 - E.g., target a "C" level of service. What bicycle and pedestrian facility geometries are necessary to attain this level of service?
 - Similar to the application of level of service in the Highway Capacity Manual
 - Consider impacts of highway improvements on pedestrian and bicycle level of service



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Basic Findings of Bicycle Level of Service Model: What Matters Most

- Adequate pavement width or separation from moving traffic.
 - Sufficient lane width
 - Wide paved shoulders
 - Bike lanes
 - Parking lane, if mostly empty
- Lower Truck Volumes
- Lower Speeds
- Lower Volumes per Lane
- Good pavement surface conditions



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Basic Findings of Pedestrian Level of Service Model: What Matters Most

- Presence of a wide, continuous sidewalk
- Buffer area between traffic and walkway
 - Wide buffer
 - Street trees
 - Parking!



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Bicycle Level of Service Model

$$BLOS = 0.507 \ln \left(\frac{Vol_{15}}{L_n} \right) + 0.1995SP_1(1 + 10.38HV)^2 + 7.066 \left(\frac{1}{PR_5} \right)^2 - 0.005(W_e)^2 + 0.760$$

Vol₁₅ = Volume of directional traffic in 15 – minute time period
 L_n = Total number of directional through lanes
 SP₁ = Effective speed limit
 HV = Percentage of heavy vehicles
 PR₅ = FHWA's five – point pavement surface condition rating
 W_e = Average effective width of outside through lane

- Sprinkle Consulting, 2002



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Pedestrian Level of Service Model

$$PLOS = -1.2021 \ln(W_{OL} + W_1 + f_p(OSP) + f_b(W_b) + f_{sw}(W_s)) + 0.253 \ln \left(\frac{Vol_{15}}{L} \right) + 0.0005SPD^2 + 5.3876$$

W_{OL} = Width of outside lane
 W₁ = Width of shoulder or bike lane
 f_p = On – street parking effect coefficient
 OSP = Percent of segment with on – street parking
 f_b = Buffer area barrier coefficient
 W_b = Buffer width (distance between edge of pavement and sidewalk)
 f_{sw} = Sidewalk presence coefficient
 W_s = Width of sidewalk
 Vol₁₅ = Volume of directional traffic in 15 – minute time period
 L = Total number of directional through lanes
 SPD = Average running speed of motor vehicle traffic

- Sprinkle Consulting, 2002



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Regional Bicycle and Pedestrian Level of Service in Metropolitan Chicago

- Measured in 2002 for Soles and Spokes process
 - Selected Communities
 - Proposed Capacity-Adding FY 2002-2006 TIP Projects
 - Method: Mostly field survey
- Measured in 2012 and 2013 for 10-year follow-up
 - Proposed FY 2002-2006 TIP Projects Only
 - Method: Mixed field and desk survey



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Results

	BLOS 2013	BLOS 2002	PLOS 2013	PLOS 2002
Total, All TIP Samples	3.84 (D)	4.05 (D)	3.88 (D)	4.20 (D)
City of Chicago	4.21 (D)	3.92 (D)	2.79 (C)	3.03 (C)
Cook County, Suburban	3.69(D)	3.92 (D)	3.56 (D)	3.60 (D)
DuPage County	3.47 (C)	4.20 (D)	3.96 (D)	4.58 (E)
Kane County	4.44 (D)	4.54 (E)	4.63 (E)	4.82 (E)
Kendall County	4.39 (D)	4.14 (D)	4.85 (E)	4.40 (D)
Lake County	3.88 (D)	3.85 (D)	4.03 (D)	4.52 (E)
McHenry County	4.03 (D)	4.27 (D)	4.79 (E)	5.17 (E)
Will County	3.77 (D)	4.10 (D)	4.12 (D)	4.67 (E)



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Discussion

- Results are by geography, not jurisdiction
- Impacts of complete streets policies? DuPage County was early adopter of such policies with its "Healthy Streets" policy
- Some changes, like high traffic growth in Kendall County, are hard to overcome
- There is still an opportunity to apply BLOS/PLOS method to highway construction decisions to maintain minimum level of service for walking and cycling.



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Bicycle and Pedestrian Level of Service

Measuring Walkability and On-Road Bikeability

Thank you.

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